

REMARKS

Claims 1, 4, 6-9, 14-17, 22-25, 30-38, and 42-49 are pending in this application. Claims 1, 4, 7-9, 15-17, 23-25, 31-33, 35, 36 37, 42, 44-46, and 49 are rejected. Claims 6, 14, 22, 30, 34, 37 and 43 are objected to. Claims 47 and 48 are allowed.

The Rejections Under Prior Art

1. Claims 1, 4, 7-9, 15-17, 23-25, 31-33, 35, 37, 42, and 44-46 are rejected under 35 U.S.C. §102(b) as being anticipated by WO 99/09036 (hereinafter, "Cruse").

As stated previously, the invention is related to increasing the hardness of silica/rubber mixtures. Fillers such as silica are added to tire compositions to improve performance characteristics, strength, wear resistance, fatigue resistance, hysteresis and the like. Coupling agents such as silanes are added to couple the silica particles to the matrix polymer to reduce filler - filler interactions, improve the dispersion of the filler and result in improved tire performance characteristics including lower hysteresis, improved wet and ice traction, and high abrasion resistance. However, these performance improvements are usually accompanied by loss of dynamic stiffness (i.e. hardness) of the filled rubber. Polysulfide silanes (e.g. TESPT and TESPD) tend to reduce hardness, and blocked mercaptosilanes reduce hardness even more, although blocked mercaptosilanes are preferred for their improvement in performance characteristics.

As described in the specification at pages 13 and 14, separation of filler-filler interactions achieved by the addition of the silane coupling agent reduces network effects and thereby tends

to decrease hardness. On the other hand, creation of silica-rubber bands by the coupling agent tends to increase hardness by enhancing bound rubber content and hydrodynamic interactions of the filler. However, in the case of the preferred blocked mercaptosilanes, such as 3-octanoylthio-1-propyltriethoxysilane, the hardness decrease from reduced network effects is greater than the increase in hardness due to silica dispersion and silica-rubber coupling. Therefore, there is an overall decrease in hardness. The object of the present invention is a method of using the preferred blocked mercaptosilanes, particularly 3-octanoylthio-1-propyltriethoxysilane, while retaining hardness levels comparable with those of TESPT and TESPD. It has been found by Applicants herein that employing an amount of silica in conjunction with the blocked mercaptosilane coupling agents higher than that conventionally used is effective for increasing the hardness to desired levels.

With respect to claim 36, Cruse discloses filler content of from about 5 to about 100 phr. (Cruse, pg. 22, lines 9-10). However, the preferred range of filler is 25-80 phr. Cruse provides no motivation or suggestion to go above 100 phr of silica. Claim 36 is amended to recite that the member of claim 1 is silica and that the silica content is above 100 phr. Claim 42 is also amended to recite a silica content above 100 phr. It is respectfully submitted that claims 36 and 42 are even further distinguished over the Cruse reference.

Reconsideration and withdrawal of the rejection are respectfully requested.

2. Claim 35 is rejected under 35 U.S.C. §103(a) as being obvious over Cruse in view of U.S. Patent No. 5,341,843 (hereinafter, "Sandstrom"). Claim 35 is amended herein to depend

from claim 6, which is submitted to be allowable. Reconsideration and withdrawal of the rejection are respectfully requested

3. Claim 38 is rejected under 35 U.S.C. §103(a) as being obvious over Cruse in view of JP 2000-319451 ("Kikuchi"). Kikuchi is directed to a tire tread rubber composition.

Claim 38 is amended herein to depend from claim 6, which is submitted to be allowable. Reconsideration and withdrawal of the rejection are respectfully submitted.

4. Claims 25, 31-32, 44-45 and 49 are rejected under 35 U.S.C. §103(a) as being obvious over Cruse in view of U.S. Patent No. 5,623,028 (hereinafter, "Fitzgerald"). Fitzgerald does not disclose the use of blocked mercaptosilanes. Fitzgerald is directed to the use of a silicone rubber composition. The MQ resin is incorporated into the silicone as a mold release agent (Col. 2, lines 12-15). One skilled in the art would find no suggestion to employ the MQ mold release agent of Fitzgerald intended for a silicone into the tire composition of Cruse. Moreover, the present claims are directed to the use of MQ resin as a hardness increasing component, not a mold release agent. Accordingly, there is not a sufficient basis for the combination of these references. Moreover, Fitzgerald does not cure the deficiencies of Cruse discussed above. Even if these references were to be combined Applicants' claimed invention would not be disclosed or suggested. Reconsideration and withdrawal of the rejection are respectfully requested.

The Claims Objected to

Claims 6, 14, 30 34, 37 and 43 are objected to but deemed to contain allowable subject matter and would be allowable if rewritten.

Claim 6 is placed into independent format by amendment herein. Claim 9 is amended to depend from claim 6, and claim 14 is cancelled as being duplicative of the scope of amended claim 9. Claim 17 is amended to depend from claim 6, and claim 22 is cancelled as being duplicative of the scope of amended claim 17. Claim 30 is placed into independent format. Claim 33 is amended to depend from claim 6, and claim 34 is cancelled as being duplicative of the scope of amended claim 33. Claim 35 is amended to depend from claim 6, and claim 37 is cancelled as being duplicative of the scope of amended claim 35. Claim 43 is placed into independent format. Accordingly, it is respectfully submitted that the objections have been overcome.

The Allowed Claims

Allowance of claims 47 and 48 is gratefully acknowledged.

CONCLUSION

For at least the reasons stated above all of the pending claims are submitted to be in condition for allowance, the same being respectfully requested.

Respectfully submitted



Adrian T. Calderone
Reg. No. 31,746
Attorney for Applicant(s)

DILWORTH & BARRESE, LLP
333 Earle Ovington Blvd.
Uniondale, NY 11553
Tel: (516) 228-8484
Fax: (516) 228-8516